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(54) Gourd powder composition.

(57) The composition comprises highly nutritious powder of gourd fruit which is available as solid nutritious food or nutritious beverages. The gourd powder composition contains the powder of gourd fruit, creaming syrup and possible L-ascorbic acid. The other nutritious ingredient can be added if necessary. When supplied as beverages, the foaming agents can be added thereto. The L-ascorbic acid is used mainly for the purpose of removing the grassy-smelling peculiar to the gourd. The creaming syrup is used to have the powder of gourd fruit deflocculated in the liquid. If the foaming agents are added thereto, the powder of gourd fruit is more easily deflocculated in the liquid and the cooling beverage like cream soda can be made.

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This invention relates to a gourd powder composition useful as a nutritious food or beverage.

The gourd is a highly nutritious food containing a well-balanced combination of sugar, fiber, protein, vitamins, calcium, pectin etc. and therefore has been eaten for food from old times. For instance, dried gourd shavings are called "kanpyo" and have long been used popularly as ingredients of "sushi" and other dishes. The dried gourd shavings have a water content of as high as 15 to 40 % in themselves. Moreover, as it is highly nutritious, it is prone to gather bacteria and mold. Thus, 3 or 4 months after preparation, it suffers a change in properties such as color, odor, taste, etc. and quality, which requires much care for storage thereof accordingly.

In order to keep the quality of dried gourd shavings, there has been proposed a storage method in which they are fumigated with sulfur, bleached, and sterilized [Japanese Patent Publication no.21292/1982: "Food Industry", Vol.3, Book II, P.52 (1983)]. However, residue of sulfur is unavoidable in this method. As is regulated by the Food Sanitation Act of Japan (i.e., the amount of residual sulfur in terms of sulfur dioxide should not be greater than 5 g per kg of food), sulfur is harmful to human and therefore the presence of any residual sulfur is undesirable. Accordingly, dried gourd shavings need to be washed in water prior to eating and this causes most of the water-soluble nutrients (such as sugars, pectin, vitamins, etc.) present therein to be washed away.

In order to overcome the above-described disadvantages, there has been proposed a gourd food made without bleaching by fumigation with sulfur (unbleached dried gourd). This unbleached dried gourd food is quite safe from the viewpoint of food sanitation, highly nutritious, and has good keeping quality, so that it can be eaten for nourishing purpose. In addition, it is known that the dried gourd contains a plenty of food fiber (Japanese Patent Laid-open no.32458/1988).

Recently, it has been found that dried gourd has the effect of promoting growth of Bifidobacterium species selectively and markedly (Japanese Patent Application no.123761/1987).

Moreover, in recent years, food fibers have attracted public attention due to the fact that they have the effect of activating the reflex in the intestines and removing coprostasis and that the incidence of rectal cancer is rare in nations with a high food fiber intake.

As the dried gourd also has the effect of promoting the growth of Lactobacillus bifidus species that depress intestinal putrefaction and improve diarrhea and constipation, it is of more importance than other general food fibers.

Processed unbleached dried gourd is available in the form of ribbons, or is processed to powder or granule form; it does, however, have a characteristic grassy-smell and, due to its high content of sugars and protein, it tends to stick to teeth or teethridges, causing some difficulty in eating. For these reasons, dried gourd in the form of ribbons is usually cooked before eating; the powdered orgranulated forms being added to "miso" soup or sprinkled on salad.

The present inventors, at first, tried to overcome the problems of the grassy-smell and the stickiness to teeth and teethridges using the following well-known additives; various spices; acidity regulators such as citric acid, malic acid, tartaric acid, etc.; sugars such as saccharose, lactose, mannitol, sorbitol, reduced maltose, etc.; antitack agents such as crystal cellulose, carboxymethylcellulose, carboxymethylcellulose calcium, etc.

However, the simultaneous solution of the two problems could not be achieved.

Furthermore, it is known that dried gourd has been eaten in solid form as in the case of unbeached dried gourd but until now it has not been known as a beverage The reason for this is that when gourd powder or granules are put into water or water-based beverages, a non-water-soluble component is precipitated in a short time.

The present inventors, at first, tried to achieve deflocculation of the gourd fruit powder using the following well-known additives;

Thickener such as carboxymethylcellulose sodium, hydroxypropyle cellulose, powder of gum arabic, starch, polyvinylpyrrolidone, etc.; surfactant such as polyethlene glycol, glycerin fatty acid ester, stearic acid polyoxyle 40, saccharose fatty acid ester, etc. However, such beverages that were stably deflocculated for a long time when added in coffee, tea, boiling water and had a-good taste could not be obtained.

It is, therefore, an object of the present invention to provide a composition of gourd fruit powder useful as a nutritious food.

It is another object of the present invention to provide a composition of gourd fruit powder useful as a nutritious beverage.

Above-described and other features and advantages of the present invention will become more apparent from following detailed description and examples.

The present invention provides a composition comprising gourd fruit powder, creaming syrup and/or L-ascorbic acid (vitamin C).

When the gourd powder composition of the present invention is used as solid food, the essential ingredients are the gourd fruit powder and L-ascorbic acid. The gourd fruit powder of the present invention is the powder made from the above-mentioned unbleached dried gourd.

The gourd fruit powder must have a standard plate viable cell count of not greater than 5×10^3 microbial cells/g and must be negative in the tests for presence of E. coli and Salmonella species according to food sanitation standards. The L-ascorbic acid also must be safe from the viewpoint of food sanitation by choosing from the lists designated in food additive regulations or in the Japanese Pharmacopoeia.

The L-ascorbic acid is added to remove the grassy-smell and avoid the stickiness to teeth and teethridges.

The preferable weight percentage of the L-ascorbic acid in the mixture to achieve these aims is less than 30 % of the total weight of the gourd powder composition and with a weight ratio of 0.8 parts of the former to 1 part of the latter.

Although the L-ascorbic acid has a strong acidity, when mixed with the powder of gourd fruit, the acidity is so masked that the good taste is not lost.

Moreover although L-ascorbic acid is unstable in water, when mixed with the gourd fruit powder, it acquires stability in water avoiding the loss in nutrititional values thereof.

Weight adjusting agents are added so that the weight percentage of the L-ascorbic acid in the mixture may be less than 30 % of the total weight of the gourd powder composition.

The following weight adjusting agents are suitable:

sugars; such as, fructose, sorbitol, mannitol, glucose, palatinose, saccharose, lactose, reduced maltose, etc.,

bifidus factor; such as, fructo-oligosaccharide, galacto-oligosaccharide, isomalto-oligosaccharide, "konnyaku" mannan (mannan from devil's tongue), soybean milk, etc.,

deflocculating agents; such as, polyethylene glycol, stearic acid, glycerin fatty acid ester, etc.,

surfactants; such as, stearic acid polyoxyle 40, polyoxyethylene hardening castor oil 60, propylene glycol, saccharose fatty acid ester etc.,

lubricants; such as, silicon dioxide, magnesium stearate, calcium stearate, talc, synthetic aluminum silicate, starches, silicon resins, etc.,

bonding agents; such as, gum arabic, polyvinylpyrrolidone, hydroxypropyle cellulose, etc.,

sweeteners; such as, D-alanine, L-alanine, glycine, stevioside, glycyrrhizin acid 2-potassium, glycyrrhizin acid, saccharin, saccharin sodium, L-aspartyl L-phenyl alanine methyl ester.,

spices coloring agents, preservatives and taste correcting agents. The kind and quantity to be added of the weight adjusting agents can be selected at discretion depending on the method of prepration and the use of the gourd powder composition.

In addition to the above-mentioned nutritious ingredients, the following additives can be mixed with the gourd powder composition to replenish the nutrients;

taste increasing ingredients such as mackerel fish powder and yeast extract etc.,

vitamins such as vitamin A, vitamin B_1, B_2, vitamin D.,

minerals such as potassium, calcium, magnesium, and iron, etc.,

restoratives such as liver hydrolyzate, taurine, royal jelly, etc.,

milk products such as skim milk, condensed yogurt, yogurt powder. Moreover, coffee, cocoa, and tea powder can be mixed by choice.

Powder, granules or tablets have been prepared from the gourd powder composition after mixing the gourd fruit powder and the L-ascorbic acid in an appropriate proportion and after adding the weight adjusting agents and optionally the nutrient replenishing ingredients.

When the gourd ponder composition is supplied as a beverage, the essential ingredients are the powder of gourd fruit and creaming syrup.

The gourd fruit powder , which means the powder of unbleached dried gourd fruit, is pulverized preferably to 42-mesh pass fine powder with an average grain diameter of over 80-mesh to achieve a better deflocculation in water or water-based beverages.

The creaming syrup is made of animal skim milk powder or whole milk powder, or of vegetable fat in condensed liquid or dried powder form mainly of corn (maize) etc.

The creaming syrup is added in order to keep the gourd fruit powder stably deflocculated in water or water-based beverages for a long time. The mixing ratio of the gourd fruit powder and the creaming syrup (powder) is not greater than 1.1 parts of the former to 1 part of the latter in weight.

The addition of the gourd fruit powder in a greater ratio increases the smell peculiar to the gourd and spoils the flavor of beverages in themselves. When the condensed liquid creaming syrup is used, the mixing ratio of the gourd fruit powder must be adjusted too, depending upon the condensation ratio.

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If a foaming agent is added to the gourd powder composition, deflocculation of the powder of gourd fruit is improved further. As a foaming agent, organic acids such as citric acid, succinic acid, malic acid, and tartaric acid, etc., and carbonates such as sodium carbonate, sodium hydrogencarbonate, potassium carbonate, etc., can be used. 0.3 to 2.5 g of foaming agent for 150 ml of water is desirable.

A foaming agent concentration of less than 0.3 g for 150 ml of water cannot improve the deflocculation of the gourd fruit powder. On the other hand a foaming agent concentration of more than 2.5 g for 150 ml of water results in excessive foaming and may cause overflow of the gourd powder deflocculated in water.

In addition to the foaming agent, in order to add nutritious ingredients, fish powder, yeast extract, vitamins, minerals, restoratives, milk products, sugars, and bifidus factor, etc., can be added.

In particular, addition of L-ascorbic acid (vitamin C) is effective for removal of the smell of the gourd. Moreover, according to choice, coffee, cocoa, tea powder deflocculating agents, sweetenings, taste correcting agents, spices coloring agents, preservatives, etc., can be added thereto.

The gourd powder composition for beverages of the present invention is a mixture of the gourd fruit powder with the creaming syrup, mixed by shaking mixers, etc., after combining in an appropriate proportion and adding the above-described various additives thereto as needed.

The gourd powder composition is formed to the slag shape or is granulated depending on the purpose of use. The high nutritious beverages are made by lightly agitating the gourd powder composition thus obtained in water or boiling water, or together with water-based beverages such as coffee, tea, cocoa, malt beverages etc. If a foaming agent is added thereto, a cooling beverage having cream foam on the surface of the liquid like cream soda is obtained.

Test 1

The grassy-smell of the gourd, stickiness to teeth or teethridges, and acidity of L-ascorbic acid were tested in the gourd powder food of the present invention for evaluation.

Preparation of materials to be tested

The designated quantities of the gourd fruit powder and L-ascorbic acid were mixed, and 400 g of saccharose and lactose as the weight adjusting agents were added thereto to a total weight of 990 g. These mixture was then mixed with Quickneeder (K-250, Daiwa Kako KK.) for 5 minutes, and then 10 g of magnesium stearate was added thereto and further mixed for one minute. This mixture was made into tablets each containing 2.5 g of the mixture using a tablet machine,to obtain materials to be tested.

The effects were organoleptically evaluated by ten panelists. The results thus obtained are shown in Tables 1-1 and 1-2. In the Tables, "○" represents the case where all panelists thought it pleasant to eat. "□" represents the case where one to three panelists thought it unpleasant to eat (for being grassy-smelling, sour or sticky). "△" represents the case where four to five panelists thought it unpleasant to eat. Finally, "X" shows the case where more than eight panelists thought it unpleasant to eat.

Table 1-1

MATERIAL NO.	1	2	3	4	5	6
COMPOSITION (%)						
Gourd powder	10	10	10	10	10	10
L-Ascorbic acid	5	7	8	10	20	25
Lactose	44	42	41	39	29	24
TEST RESULTS						
Grassy-smelling	×	△	□	○	○	○
Acidity	○	○	○	○	○	○
Stickiness	△	△	□	○	○	○

MATERIAL NO.	7	8	9	10	11	12
COMPOSITION (%)						
Gourd powder	10	10	20	20	20	20
Ascorbic acid	30	35	10	14	16	20
Lactose	19	14	29	25	23	19
TEST RESULTS						
Grassy-smelling	○	○	×	△	□	○
Acidity	□	△	○	○	○	○
Stickiness	○	○	△	△	□	□

Table 1-2

MATERIAL NO.	13	14	15	16	17	18
COMPOSITION (%)						
Gourd powder	20	20	20	20	0	0
L-Ascorbic acid	25	30	35	39	5	10
Lactose	14	9	4	0	54	49
TEST RESULTS						
Grassy-smelling	○	○	○	○	○	○
Acidity	○	□	△	×	○	○
Stickiness	○	○	○	○	○	○

MATERIAL NO.	19	20	21	22	23	24
COMPOSITION (%)						
Gourd powder	0	0	0	0	0	0
L-Ascorbic acid	15	20	25	30	35	40
Lactose	44	39	34	29	24	19
TEST RESULTS						
Grassy-smelling	○	○	○	○	○	○
Acidity	□	△	×	×	×	×
Stickiness	○	○	○	○	○	○

Test 2:

Stability of the L-ascorbic acid in the gourd fruit powder of the present invention was studied using the following four materials to be tested.

test materials prepared in the same manner as the gourd powder food of test material no.5 in Test 1 (thereafter called "A").

Test materials prepared by removing gourd fruit form "A" and adding lactose instead (called "B").

Test materials prepared in the same manner as the gourd powder food of test materials no.13 in Test 1 (thereafter called "C").

Test materials prepared by removing the gourd fruit powder form "C" and adding lactose instead (called "D").

Preparation of test materials

Each material was put into a polyethylene bottle, and stored in a thermostat at 40 • C for three months either (i) immediately after preparation (about 1.5% weight reduction due to drying; or (ii) after being dried with silica gel for eight hours (about 0.8 % weight reduction due to drying); or (iii) after being dried with silica gel for twenty four hours(about 0.2% weight reduction due to drying), respectively. quantitatively after one month and three months respectively. The quantitative test was made according to the Iodometry Method in the Japanese Pharmacopoeia. The results thus obtained are shown in Table 2.

Table 2

	Weight reduction due to drying at start of tests (%)	Residual rate (%)	
		Duration of storage 1 month	Duration of storage 3 months
A	1.6	97.9	91.5
	0.9	98.5	95.3
	0.1	99.9	100.3
B	1.4	94.5	84.1
	0.8	97.0	92.7
	0.2	100.2	99.3
C	1.4	98.3	92.8
	0.9	99.8	96.6
	0.2	100.0	100.1
D	1.5	93.5	85.2
	0.7	97.9	95.1
	0.1	100.1	100.3

It is evident from Tables 1 and 2 that, in the gourd powder food of the present invention, if the ratio of L-ascorbic acid to the powder of gourd fruit is more than 0.8 to 1 in weight and is less than 30 % of the total weight of the mixture, the grassy-smell peculiar to the gourd is masked and the stickiness to teeth or teethridges is depressed, and, further, the strong acid taste due to L-ascorbic acid is masked and the stability of L-ascorbic acid in water is restored. Therefore, the gourd powder food of the present invention has a good taste which is stable over a long period of time.

Example 1

100 g of the powder of gourd fruit, 70 g of water fleas, 619.75 g of saccharose, 0.25 g of stevioside and 200 g of L-ascorbic acid were mixed in the Quickneeder for three minutes, and, then, 60 g of water was added thereto and agitated for two minutes. The mixture thereof was dried at 55 • C for two hours. After leaving it to cool, the granules for tablet were obtained by sieving through a 12-mesh-screen.

After adding 10 g of magnesium stearate to the granules thus obtained and mixing, tablets each containing 3 g were made with the tablet machine. These tablets had a soft taste easily taken without the grassy-smell peculiar to the gourd and without sticky properties.

Example 2

250 g of the gourd fruit powder 250 g of L-ascorbic acid, 304.7 g of mannitol, 150 g of taurine, 35 g of gum arabic powder, and 0.3 g of stevioside were mixed in the Quickneeder for three minutes, and then, 50 g of water was added thereto and agitated for two minutes. Then the mixture was dried for two hours at 55 ° C. After leaving it to cool, the granules for tablets were prepared by sieving through a 12-mesh screen. After adding 10 g of magnesium stearate to the granules and mixing tablets each containing 250 mg were made with the tablet machine. This tablet had a soft taste easily taken without the grassy-smell peculiar to the gourd and without sticky properties.

Next, deflocculation of the gourd fruit powder composition of the present invention in water-based beverages is described.

Test 3:

Eight kinds of natural non-water-soluble food fibers, i.e., unbleached gourd powder, apple fiber, bran powder, crystal cellulose, carrot powder, pumpkin powder and soybean flour, were used. As creaming syrup, the corn syrup powder was used.

Each test material was prepared by mixing 20 g of food fiber with 20 g of sugar and 60 g of creaming syrup (corn syrup) in the mortar.

5 g of each test material was taken into a 100 cc-measuring cylinder and 80 cc of boiling water was added thereto and sealed up. The mixture was then agitated and left at room temperature for 24 hours. Then the precipitation and the deflocculation were measured and evaluated. The mixture of 1 g of the gourd powder and 1 g of sugar was used as a control.

Flocculation percentage = (b/a) x 100

a = total quantity (ml) of water-base beverage
b = quantity (ml) obtained by deducting the precipitated quantity (ml) from "a".

The results thus obtained are shown in Table 3.

Table 3

	Precipitated quantity (g)	Flocculation percentage (%)
Unbleached gourd powder	0.0	0.0
Apple fiber	0.8	77.0
Corn fiber	1.1	85.9
Bran powder	0.8	88.9
Crystal cellulose	1.1	85.9
Carrot powder	0.7	86.7
Pumpkin powder	0.8	77.0
Soybean flour	0.8	88.9
Control	0.5	62.2

It is evident from Table 3 that the unbleached gourd powder was deflocculated in water-base beverages better than other food fibers.

Test 4:

Whole milk powder (71 % skim solid milk, 25 % milk fat) was used as an animal creaming syrup. The corn syrup (powder) was used as a vegetable creaming syrup.

The designated quantity of the powder of gourd fruit was measured and fully mixed with creaming syrup at a predetermined ratio in the mortar.

5 g of each material was taken into a 100 cc-centrifugation tube and 80 cc of boiling water was added and then sealed up. The mixture was agitated and left at room temperature for 24 hours. Then the precipitated quantity was measured for evaluation. At the same time, the taste of the deflocculated liquid was evaluated by panelists organoleptically.

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The results thus obtained are shown in Tables 4-1 to 4-4. In the Tables, the mixing percentage represents the quantity of the powder of gourd fruit contained in the whole gourd powder composition.

"○" represents the case where all panelists thought it pleasant to drink.
"□" represents the case where one to three panelists thought it unpleasant to drink.
"△" represents the case where four to seven panelists thought it unpleasant to drink.
"X" represents the case where more than eight panelists thought it unpleasant to drink.

Table 4-1

Test material no.	1	2	3	4
Gourd powder (weight parts)	0.1	0.5	0.7	1.0
Whole milk powder (weight parts)	1.0	1.0	1.0	1.0
Mixing percentage (%)	9.1	33.1	41.2	50.0
Precipitated quantity (g)	0.0	0.0	0.0	0.0
Taste	○	○	○	○

Table 4-2

Test material no.	5	6	7	8
Gourd powder (weight parts)	1.1	1.2	1.3	1.5
Whole milk powder (weight parts)	1.0	1.0	1.0	1.0
Mixing percentage (%)	52.4	54.5	56.5	60.0
Precipitated quantity (g)	0.0	0.3	0.7	1.1
Taste	□	△	X	X

Table 4-3

Test material no.	9	10	11	12
Gourd powder (weight parts)	0.1	0.5	0.8	1.0
Corn syrup (weight parts)	1.0	1.0	1.0	1.0
Mixing percentage (%)	9.1	33.3	44.4	50.0
Precipitated quantity (g)	0.0	0.0	0.0	0.0
Taste	○	○	○	○

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Table 4-4

Test material no.	13	14	15	16
Gourd powder (weight parts)	1.1	1.2	1.3	1.5
Corn syrup (weight parts)	1.0	1.0	1.0	1.0
Mixing percentage (%)	52.4	54.5	56.5	60.0
Precipitated quantity (g)	0.0	0.2	0.6	1.1
Taste	□	△	X	X

It is evident from Tables 4-1 to 4-4 that if the ratio of addition of the powder of gourd fruit to creaming syrup is not greater than 1.1 in weight parts, the gourd powder composition is deflocculated uniformly in water-based beverages, is stable for a long period of time, and has a good taste.

Therefore, the gourd powder composition of the present invention can be taken as a beverage by mixing it with water-base beverages such as coffee, tea, cocoa, boiling water, and water.

Example 3

The gourd powder composition was made by mixing 200 g of the powder of gourd fruit with 800 g of whole milk powder (71 % skim solid milk, 25 % milk fat) in the mixer (Quickneeder K-250, Daiwa Kako KK.) for 5 minutes.

When 5 g of the gourd powder composition was added to 150 ml of coffee and mixed lightly, it was deflocculated uniformly and quickly and tasted good.

Example 4

The gourd composition was made by mixing 400 g of whole milk powder (71 % skim solid milk, 25 % milk fat), 120 g of the powder of gourd fruit, 200 g of cocoa powder, 154.5 g of fructose, 50 g of liver hydrolyzate, 0.5 g of vitamin B_2, 50 g of bone powder, and 25 g of yeast extract for 5 minutes in the mixer.

When about 200 ml of boiling water was added to about 20 g of the gourd powder composition and mixed lightly, it was deflocculated quickly and uniformly and tasted good.

Example 5

The gourd composition was made by mixing 400 g of corn syrup powder, 400 g of the powder of gourd fruit, 200 g of reduced maltose in the mixer for 5 minutes.

When 50 g of the gourd powder composition was added to 1000 ml of cow's milk and mixed lightly, it was deflocculated quickly and uniformly. It tasted good when cooled in the refrigerator.

Example 6

70 g of 70 % (W/W) ethanol was added in agitation to 1 kg of the gourd powder composition obtained in Example 5, and further mixed in the mixer for 2 minutes. The mixture, then, was dried at 50 °C for 3 hours and sieved to make the granule of the gourd powder composition.

The gourd powder composition is superior in its handling. 2.5 g of it was added to 150 ml of coffee resulting in quick deflocculation and long stability therein.

Example 7

300 g of a mixture of corn syrup powder and skim milk with a mixing ratio of 1 to 1, 100 g of the powder of gourd fruit, 400 g of saccharose, 10 g of malic acid, 2 g of stevia, 180 g of yogurt powder, and 8 g of magnesium stearate were mixed in the mixer for 5 minutes to make tablets each containing 5 g of the gourd powder composition in the form of slags using the tablet machine.

When the composition was put in 100 g of water, it was deflocculated quickly. It tasted good when drunk with ice.

Now, a test of the foaming properties of the gourd powder composition and deflocculating of the powder of gourd fruit in water is described.

As non-water-soluble powders in the test, the unbleached powder fruit powder, apple fiber, corn fiber, crystal cellulose, carrot powder, pumpkin powder, and potato starch were used. As creaming syrup, corn syrup powder was used.

Each test material was prepared by mixing 83.3 g of non-water-soluble powder, 150 g of creaming syrup, 220 g of foaming agent, 70 g of citric acid, 200 g of lactose, 250 g of saccharose, 2 g of silicon dioxide, and 24.7 g of saccharose fatty acid ester in the mixer (Quickneeder K-250, Daiwa Kako KK.) for about five minutes to make tablets each containing 6 g of the mixture.

To observe the foaming properties in water, one tablet was put into 150 ml of water in a 200 ml-beaker to have it effervesce. The first maximum height of the foam (A) and the height of foam (B) raised two minutes later were measured for comparison.

The deflocccculation of non-water-soluble powder was evaluated by observing the precipitating level 30 minutes later. The material which did not contain non-water-soluble powder was prepared as a control.

The results thus obtained are shown in Table 5.

Table 5

	Effervescent effects		Deflocculation effects
	A (mm)	B (mm)	Precipitates
Unbleached gourd powder	15	10	none
Apple fiber	5	2	present
Corn fiber	9	3	present
Crystal cellulose	8	1	present
Carrot powder	8	2	present
Pumpkin powder	9	1	present
Potato starch	5	1	present
Control	4	1	present
A: Maximum height of foam at the time of tablet addition B: Height of foam two minutes later			

As shown in Table 5 clearly, the unbleached gourd powder is superior in the effervescent effects to other non-water-soluble powder and is well deflocculated.

Therefore, good cooling beverages can be made using the gourd composition of the present invention.

Example 8

100 g of the unbleached powder of gourd fruit, 167 g of L-ascorbic acid, 167 g of corn syrup, 200 g of mole equivalent mixture of citric acid and sodium hydrogencarbonate, 10 g of stevioside, 201 g of saccharose, and 150 g of skim milk were mixed in the Quickneeder and then formed by a roll press (made by Freund Industrial Co., Ltd.) to plate forms. Then, the granule composition was made after sieving through a 10-mesh screen.

When 6 g of the composition was put into 150 ml of water, a cooling beverage of gourd, having cream foam on the surface of the liquid was obtained.

Example 9

150 g of the unbleached powder of gourd fruit, 350 g of skim milk, 250 g of mole equivalent mixture of tartaric acid and sodium hydrogencarbonate, 250 g of reduced maltose, 10 g of saccharose fatty acid ester, 30 g of citric acid, and 5 g of silicon dioxide were mixed in the Quickneeder for 3 minutes to make tablets containing 6 g per each of the mixture using the tablet machine.

When one tablet was put into 150 ml of water, it became effervescent and a cooling beverage of gourd was obtained.

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Example 10

85 g of the unbleached powder of gourd fruit, 200 g of skim milk, 200 g of mole equivalent mixture of tartaric acid and sodium hydrogencarbonate, 91 g of reduced maltose, 100 g of saccharose, 1 g of vitamin B_1, 167 g of taurine, 1 g of vitamin B_2, 150 g of fructo-oligosaccharide, and 5 g of silicon dioxide were mixed in the Quickneeder for 3 minutes and the tablets of the powder of gourd fruit containing 6 g per each were made.

The addition of this tablet into 150 ml of water made the tablets effervescent and produced a cooling beverage of gourd.

Example 11

100 g of the unbleached powder of gourd fruit, 350 g of corn syrup, 250 g of mole equivalent mixture of tartaric acid and sodium hydrogencarbonate, 250 g of reduced maltose, 10 g of stevioside, 10 g of sodium chloride, 25 g of malic acid, and 5 g of silicon dioxide were mixed in the Quickneeder and formed into plates with the roll-press to make the granule composition after sieving through 10-mesh screen.

When 6 g of the composition was put into 150 ml of water, it become effervescent and a cooling beverage of gourd having foams on the surface of the liquid was made.

Claims

1. A gourd powder composition comprising gourd fruit powder and creaming syrup.

2. A composition as claimed in claim 1 wherein the weight ratio of the gourd fruit powder to creaming syrup is not greater than 1.1:1.

3. A composition as claimed in either one of claims 1 and 2 wherein said gourd fruit powder is a 42-mesh pass powder with an average grain diameter of more than 80 mesh.

4. A composition as claimed in any one of claims 1 to 3 wherein said creaming syrup is animal skim mild powder or whole milk powder.

5. A composition as claimed in any one of claims 1 to 4 wherein said creaming syrup is dried vegetable fat powder.

6. A composition as claimed in any one of claims 1 to 5 further comprising a foaming agent.

7. A composition as claimed in claim 6 wherein said foaming agent is an organic acid or carbonate that has been approved as a food additive.

8. A composition as claimed in any one of claims 1 to 7 further comprising a weight adjusting agent.

9. A composition as claimed in any one of claims 1 to 8 in the form of a powder or granules or tablets.

10. A composition as claimed in any one of claims 1 to 9, further comprising L-ascorbic acid.

11. A composition as claimed in claim 10 wherein the weight ratio of L-ascorbic acid to gourd fruit powder is not greater than 0.8: 1 and the L-ascorbic acid content is less than 30% of the total weight of the composition.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 20 2964

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	JOURNAL OF DAIRY SCIENCE. vol. 50 , 1967 , CHAPAIGN, ILLINOIS US pages 1049 - 1054 W. BREENE 'Properties of spray-dried combinations of milk and fruits and vegetables' * page 1052, column 2; tables 2,3 *	1-4,9	A23L1/212 A23L1/302 A23L2/38 A23P1/02
X	JOURNAL OF DAIRY SCIENCE. vol. 49 , 1966 , CHAPAIGN, ILLINOIS US pages 762 - 767 S. COULTER AT AL. 'Spray-drying of fruits and vegetables using skimmilk as a carrier' * page 763; figure 1; table 1 *	1-4,9-11	
X	US-A-3 169 875 (M. HOOVER ET AL.) * column 3, line 5 - line 25; claims 1,2 *	1,2,9	
X	US-A-3 597 231 (F. KANE) * column 3 - column 4; claim 1 *	1,2,4,8,9	TECHNICAL FIELDS SEARCHED (Int.Cl.5) A23L
A	PATENT ABSTRACTS OF JAPAN vol. 8, no. 255 1984 & JP-A-59 132 868 (TAKAMASA NAKAYAMA) 1984 * abstract *	1	
X	DATABASE WPI Week 7616, 1976 Derwent Publications Ltd., London, GB; AN 76-29061X & JP-A-51 026 265 (NAKANO) * abstract *	1-4,8,9	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18 November 1993	DESMEDT, G

CATEGORY OF CITED DOCUMENTS

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	EP-A-0 190 689 (TAKEDA CHEMICAL INDUSTRIES) * page 3, line 33 - line 40; claims 1-9; examples 1-9 *	1,6,7	
A	FR-A-2 263 705 (I.F.A.C.) * page 3, line 33 - line 40; claim 1; example *	1,10	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

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